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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,527	08/24/2006	Marcus Brian Mayhall Fenton	C049105/0225758	9772

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EXAMINER	
CERNOCH, STEVEN MICHAEL	
ART UNIT	PAPER NUMBER
3752	
MAIL DATE	DELIVERY MODE
08/05/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,527	FENTON ET AL.	
	Examiner	Art Unit	
	STEVEN M. CERNOCH	3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39 and 41-60* is/are pending in the application.

4a) Of the above claim(s) *7,13,16-18,23-27,29-34,45,48 and 53-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-12,14,15,19-22,28,35-39,41-44,46,47,49-52 and 56-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6, 8-12, 14, 15, 19-22, 28, 35-44, 46, 47, 49-52 and 56-60 are provisionally rejected on the ground of nonstatutory double patenting over claims 52-89 of copending Application No. 10/590,456. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: An apparatus for generating a mist comprising: a housing having a plurality of interior walls, at least one of the plurality of interior walls defining a passageway along a longitudinal center axis,

the passageway having an inlet, a plenum adjacent to the inlet, and a portion adjacent to the plenum, and an outlet, the at least one of the plurality of interior walls being tapered outwardly with respect to the axis along the portion; a protrusion with a solid interior located proximate the portion, the protrusion having an outer surface tapered outwardly with respect to the axis; a transport nozzle defined between: the at least one of the plurality of interior walls tapered outwardly with respect to the axis along the portion, and the outer surface tapered outwardly of the protrusion; a working nozzle being defined by other of the plurality of interior walls of the housing, the working nozzle being coincident the transport nozzle so that a working fluid communicated to the working nozzle mixes with a transport fluid exiting the transport nozzle; and a working fluid inlet disposed along the housing in communication with the working nozzle; wherein the working nozzle is defined by a working nozzle outer surface facing inward toward the axis and a working nozzle inner surface facing outward away from the axis; wherein at least part of the working nozzle outer surface converges toward the axis in a direction along the axis toward the outlet.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 112

The rejection of claim 1 under 112, second paragraph has been withdrawn in view of the amendment dated 2/19/2010.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-6, 8-12, 14, 15, 19-22, 28, 25-44, 49-52 and 56-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rummel et al. (US Pub No 2003/0150624) in view of Pennamen et al. (US Pat No 5,810,252).

Re claims 1, 2, 4 and 38, Rummel et al. shows an apparatus for generating a mist (Fig. 5) comprising: a conduit (26) having a mixing chamber (20) and an exit (2); and a means for creating a dispersed droplet flow regime, said means comprising: a working fluid inlet (6) in fluid communication with said conduit (26) to introduce a working fluid into the conduit (26); and a transport nozzle (5) in fluid communication with the said conduit (26) to introduce a transport fluid into the mixing chamber (20); wherein the transport nozzle (5) includes a convergent-divergent portion therein such as in use to provide for the generation of high velocity flow of the transport fluid; and wherein the transport nozzle (5) and conduit (26) have a relative angular orientation (α) at the mixing chamber (20) for the introduction of transport fluid flow from the transport nozzle (5) into working fluid flow from the conduit (26) and for shearing of the working fluid by the transport fluid, wherein the spray system is portable.

Rummel et al. does not teach in which a substantial portion of the droplets have a size of less than 10 um.

However, Pennamen et al. does teach in which a substantial portion of the droplets have a size of less than 10 um (abstract).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the droplets of Rummel et al. with the size of Pennamen et al. to utilize a fine droplet size (abstract).

Re claim 3, Rummel et al. shows a cumulative droplet distribution but does not teach that it is greater than 90%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the distribution be greater than 90%, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Re claim 5, Rummel et al. does not show further comprising an annular working nozzle substantially circumscribing the transport nozzle.

However, Pennamen et al. does teach an annular working nozzle (Fig. 1, 9) substantially circumscribing the transport nozzle (16).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the nozzle arrangement of Rummel et al. with that of Pennamen et al. for successive flow (col. 4, lines 33-37).

Re claim 6, Rummel et al. shows wherein the mixing chamber includes a converging portion (Fig. 5, 20).

Re claim 8, Rummel et al. does not teach wherein the the transport nozzle has an exit area to throat area ratio, in the range 1.75 to 15, and has an included angle substantially equal to or less than 6 degrees for supersonic flow.

However, Pennamen et al. does teach wherein the internal geometry of the transport nozzle has an area ratio, namely exit area to throat area, in the range 1.75 to 15 (col. 2, lines 61-63).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the geometry of Rummel et al. with that of Pennamen et al. to ensure an atomization orifice (col. 2, lines 52-56).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the included angle substantially equal to or less than 6 degrees for supersonic flow, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Re claim 9, Rummel et al. teaches that the transport nozzle is angled but does not teach wherein the transport nozzle is oriented at an angle of between 0 to 30 degrees. It would have been obvious to one having ordinary skill in the art at the time the invention was made to orient the nozzle at an angle of between 0 to 30 degrees, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Re claim 10, Rummel et al. shows wherein the transport nozzle (Fig. 5, 5) is annular and has a divergent or convergent flow pattern.

Rummel et al. does not teach that the transport nozzle is annular.

However, Pennamen et al. does teach that the transport nozzle is annular (Fig. 1, 16).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the nozzle arrangement of Rummel et al. with that of Pennamen et al. for successive flow (col. 4, lines 33-37).

Re claim 11, Rummel et al. shows wherein the transport nozzle (Fig. 5, 5) has inner and outer surfaces each being substantially frustoconical in shape.

Re claim 12, Rummel et al. shows further including a working nozzle (Fig. 5, 5') in fluid communication with the conduit (26) for the introduction of working fluid into the mixing chamber (20).

Re claim 14, Rummel et al. shows wherein the working nozzle (Fig. 5, 5') is annular at the mixing chamber (20).

Rummel et al. does not teach that the working nozzle is annular.

However, Pennamen et al. does teach that the working nozzle is annular (Fig. 1, 9).

Re claim 15, Rummel et al. shows wherein the working nozzle (Fig. 5, 5') has inner and outer surfaces each being substantially frustoconical in shape.

Re claim 19, Rummel et al. shows wherein the conduit includes a passage (Fig. 5, 26).

Re claim 20, Rummel et al. shows wherein the inner wall of the passage (Fig. 5, 26) comprises a contoured portion (37) comprising a means to induce turbulence of the working fluid upstream of the transport nozzle (5).

Re claim 21, Rummel et al. shows wherein the mixing chamber includes an inlet (Fig. 5, 6) for the introduction of an inlet fluid.

Re claim 22, Rummel et al. shows wherein the mixing chamber (Fig. 6, 36) is closed upstream of the transport nozzle (5).

Re claim 28, Rummel et al. shows further including control means to control one or more of the flow rate, pressure, velocity, quality, and temperature of the inlet and/or working and/or transport fluids (paragraph 0018).

Re claim 35, Rummel et al. does not teach a transport fluid in the form of steam.

However, Pennamen et al. does teach steam (col. 2, lines 64-65).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the gaseous fluid of Rummel et al. with the steam of Pennamen et al. to aid in atomization (col. 2, lines 52-55).

Re claim 36, Rummel et al. shows further including working fluid in the form of water (paragraph 0033).

Re claim 37, Rummel et al. shows a water supply (col. 5, lines 24-25).

Rummel et al. does not teach a steam generator.

However, Pennamen et al. does teach steam (col. 2, lines 64-65).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the gaseous fluid of Rummel et al. with the steam of Pennamen et al. to aid in atomization (col. 2, lines 52-55).

Re claim 39, Rummel et al. shows a method of generating a mist comprising the steps of: introducing a flow of transport fluid (Fig. 5, 8) into a mixing chamber (20)

through an annular transport nozzle (5); introducing a working fluid (6) into the mixing chamber (20) through an annular working nozzle (5'); generating a high velocity flow of the transport fluid by way of a convergent- divergent portion within the transport nozzle; orienting the transport nozzle and the working nozzle (5') such that the high velocity transport fluid flow imparts a shearing force on the working fluid flow (α); and atomizing the working fluid and creating a dispersed droplet flow regime of droplets under the shearing action of the working fluid on the transport fluid.

Rummel et al. does not teach that the transport and working nozzles are annular, in which a substantial portion of the droplets have a size of less than 10 um.

However, Pennamen et al. does teach that the transport nozzle is annular (Fig. 1, 16) and that the working nozzle is annular (9) in which a substantial portion of the droplets have a size of less than 10 um (abstract).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the droplets and nozzle arrangement of Rummel et al. with that of Pennamen et al. to utilize a fine droplet size (abstract) and for successive flow (col. 4, lines 33-37).

Re claim 41, Rummel et al. shows wherein the stream of transport fluid introduced into the mixing chamber is annular (Fig. 5, 5).

Re claim 42, Rummel et al. shows wherein the apparatus has an axis and the working nozzle (5') is defined by a working nozzle outer surface facing inward toward the axis and a working nozzle inner surface facing outward away from the axis; wherein

at least part of the working nozzle outer surface converges toward the axis in a direction along the axis toward the mixing chamber.

Re claim 43, Rummel et al. does not show wherein the working nozzle circumscribes the transport nozzle.

However, Pennamen et al. does teach an annular working nozzle (Fig. 1, 9) circumscribes the transport nozzle (16).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the nozzle arrangement of Rummel et al. with that of Pennamen et al. for successive flow (col. 4, lines 33-37).

Re claim 44, Rummel et al. shows wherein an inlet fluid (Fig. 5, 6) is introduced into the mixing chamber (20) via an inlet (26) of the mixing chamber of the apparatus.

Re claim 49, Rummel et al. shows wherein the mist is controlled by modulating at least one of the following parameters: the flow rate, pressure, velocity, quality and/or temperature of the transport fluid; the flow rate, pressure, velocity, quality and/or temperature of the working fluid; the flow rate, pressure, velocity, quality and/or temperature of the inlet fluid; the angular orientation of the transport and/or working and/or secondary nozzle(s) of the apparatus; the internal geometry of the transport and/or working and/or secondary nozzle(s) of the apparatus; and the internal geometry, length and/or cross section of the mixing chamber (paragraph 0018).

Re claims 50 and 51, Rummel et al. does not teach wherein the mist is controlled to have a substantial proportion of its droplets having a size less than 20 um or 10 um.

Rummel et al. does not teach in which a substantial portion of the droplets have a size of less than 10 um.

However, Pennamen et al. does teach in which a substantial portion of the droplets have a size of less than 20 um and 10 um (abstract).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the droplets of Rummel et al. with the size of Pennamen et al. to utilize a fine droplet size (abstract).

Re claim 52, Rummel et al. shows including the generation of condensation shocks and/or momentum transfer to provide suction within the apparatus (paragraph 0022).

Re claim 56, Rummel et al. does not teach a transport fluid in the form of steam or an air/steam mixture.

However, Pennamen et al. does teach steam (col. 2, lines 64-65).

Therefore it would have been obvious to one of ordinary skill in the art to have the motivation to modify the gaseous fluid of Rummel et al. with the steam of Pennamen et al. to aid in atomization (col. 2, lines 52-55).

Re claim 57, Rummel et al. shows further including working fluid in the form of water (paragraph 0033).

Re claims 58-60, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

Claims 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rummel et al. (US Pub No 200./0150624) in view of Pennamen et al. (US Pat No 5,810,252) as applied to claims 1-6, 8-12, 14, 15, 19-22, 28, 25-44, 49-52 and 56-60 above, and further in view of Base et al. (US Pat No 6,003,789).

Re claims 46 and 47, Rummel et al. does not teach wherein the method includes the step of introducing the transport fluid into the mixing chamber as a supersonic flow or a sub-sonic flow.

However, Base et al. does teach introducing the fluid into the mixing chamber as a supersonic flow or a sub-sonic flow (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the velocity of Rummel et al. with that of Base et al. to reduce droplet size (abstract).

Response to Arguments

Applicant's arguments filed 2/19/2010 have been fully considered but they are not persuasive. Firstly, the applicant's cooperation is noted and appreciated. On the issue of the provisional non-statutory double patenting rejection, the rejection shall be maintained and repeated in any subsequent office actions until it has been addressed and resolved. As noted above, the rejection made under 112, second paragraph, has been withdrawn. With regard to the applicant's arguments, first against Rummel, as is noted in the abstract, this is a nozzle for foaming, spraying or misting. Regarding the arguments against Pennamen et all, the applicant is wholly incorrect in the assertion that Pennamen teaches a droplet size of 100 micrometers. What is stated in the

abstract is a droplet size of 100 thousandths of a millimeter. Note the suffix. This is equal to 1 X 10^{-8} meters, or 1 X 10^{-5} millimeters, or 10 nanometers, which is indeed smaller than 10 micrometers. With regards to the argument of claim 3, as the structure present in Rummel is capable of performing the limitations, finding the optimal distribution of droplet size, in this case be greater than 90% is still routine skill in the art. Regarding the argument of claim 11, the bore's themselves may not be annular, but the inner and outer surfaces are still made of pieces that are frusto-conical in shape. Concerning the argument of claim 20, contouring is defined as designed to follow the original lines of something, therefore component 37 is contoured to follow the conduit 26 and meets the claimed limitation. Finally, in response to applicant's argument that there is no suggestion to combine the references, the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. In re Nomiya, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re McLaughlyin, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA) 1969. In this case, the motivation to combine Rummel and Pennamen is to utilize a fine droplet size as disclosed in the abstract of Pennamen. The motivation to combine Rummel and Base is to reduce the droplet size as disclosed in the abstract of Base.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN M. CERNOCH whose telephone number is (571)270-3540. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. M. C./
Examiner, Art Unit 3752
7/7/2010
/Len Tran/
Supervisory Patent Examiner, Art Unit 3752